Please replace claim 1 as follows.

1. (Amended) A mucoadhesive polymer comprising not more than 10 different monomers and at least one non-terminal thiol group.

Please add new claims 28-99 as follows.

--28. A polymer as set forth in claim 1, said polymer comprising at least 0.05 μmol of covalently bound thiol groups per gram of polymer.

29. A polymer as set forth in claim 1, said polymer comprising at least 0.1 μmol of covalently bound thiol.

30. A polymer as set forth in claim 1, said polymer being selected from the group consisting of a thiolated copolymer of acrylic acid and divinyl glycol, thiolated chitosan, thiolated sodium carboxymethylcellulose, thiolated sodium alginate, thiolated sodium hydroxypropylcellulose, thiolated hyaluronic acid, thiolated pectin and derivatives of said thiolated polymers.

31. A polymer as set forth in claim 1, wherein said thiol groups are cysteine groups.

32. A polymer as set forth in claim 31, wherein said cysteine groups are bound to said polymer via an amide bond.

33. A polymer as set forth in claim 1, wherein said polymer includes at least one monomer having free thiol groups within said polymer.

34. A polymer as set forth in claim 1, said polymer exhibiting a total work of adhesion (TWA) of more than 120 μJ to intestinal mucosa at a pH of 7.

A3 35. A polymer as set forth in claim 1, said polymer exhibiting a total work of adhesion (TWA) of more than 150 μJ to intestinal mucosa at a pH of 7.

36. A polymer as set forth in claim 1, said polymer exhibiting a total work of adhesion (TWA) increased by at least 30% relative to a mucoadhesive polymer not containing at least one non-terminal thiol group, measured at a pH optimum of the total work of adhesion (TWA) of the thiolated polymer.

37. A polymer as set forth in claim 1, said polymer exhibiting a total work of adhesion (TWA) increased by at least 50% relative to a mucoadhesive polymer not containing at least one non-terminal thiol group, measured at a pH optimum of the total work of adhesion (TWA) of the thiolated polymer.

38. A polymer as set forth in claim 1, said polymer exhibiting a total work of adhesion (TWA) increased by at least 100% relative to a mucoadhesive polymer not

containing at least one non-terminal thiol group, measured at a pH optimum of the total work of adhesion (TWA) of the thiolated polymer.

39. A pharmaceutical composition comprising a mucoadhesive polymer having not more than 10 different monomers and at least one non-terminal thiol group, and at least one active substance capable of being taken up via mucosae.

A3

40. A pharmaceutical composition as set forth in claim 39, wherein said active substance is non-covalently bound to said polymer.

41. A pharmaceutical composition as set forth in claim 39, said pharmaceutical composition being provided in a form selected from the group consisting of a tablet, a suppository, a pellet, eyedrops, nosedrops, eardrops, an eye-gel, a nose-gel, an ear-gel, an application for inhalation, microparticles and nanoparticles.

42. A pharmaceutical composition as set forth in claim 39, wherein said active substance is a substance whose activity is enhanced by thiol groups.

43. A pharmaceutical composition as set forth in claim 42, wherein said active substance enhanced by thiol groups is a thiol-dependent enzyme.

44. A pharmaceutical composition as set forth in claim 43, wherein said thiol-dependent enzyme is selected from the group consisting of papain and subtilisin.

45. A pharmaceutical composition as set forth in claim 39, wherein said composition is in a form suitable for peroral administration.

46. A pharmaceutical composition as set forth in claim 39, wherein said active substance is in a form suitable for delayed release.

A3

47. A pharmaceutical composition as set forth in claim 46, wherein said active substance is present within a polymer tablet and said active substance is capable of penetrating through the polymer coat upon administration to a patient.

48. A method of enhancing permeation of active substances through mucosa in an individual, said method comprising administering to said individual an effective amount of a pharmaceutical composition comprising a mucoadhesive polymer having not more than 10 different monomers and at least one non-terminal thiol group, and at least one active substance capable of being taken up via a mucosa.

49. A method as set forth in claim 48, wherein said pharmaceutical composition comprises an active (poly)peptide substance.

50. A method of enhancing permeation of active substances through mucosa in an individual, said method comprising administering to said individual an effective amount of a pharmaceutical composition comprising

a mucoadhesive polymer having not more than 10 different monomers and at least one non-terminal thiol group, wherein said mucoadhesive polymer is selected from the group consisting of a thiolated copolymer of acrylic acid and divinyl glycol, thiolated chitosan, thiolated sodium carboxymethylcellulose, thiolated sodium alginate, thiolated sodium hydroxypropylcellulose, thiolated hyaluronic acid, thiolated pectin and derivatives of these thiolated polymers, and

at least one active substance capable of being taken up via a mucosa.

51. A method according to claim 50, wherein said thiol groups are cysteine groups.

52. A method as set forth in claim 50, wherein said mucosa is an intestinal mucosa.

53. A method of treating an individual in need of a treatment wherein the active ingredient is taken up via mucosae, said method comprising administering to said individual an effective amount of a pharmaceutical composition comprising a mucoadhesive polymer having not more than 10 different monomers and at least one non-terminal thiol group and at least one active substance to be taken up via mucosae, wherein said active ingredient is

capable of adhering to a mucosa selected from the group consisting of intradermal, intraocular and intraarticular mucosa.

54. A method of inhibiting enzymes in an individual, said method comprising administering to said individual an effective amount of a pharmaceutical composition which comprises a mucoadhesive polymer having not more than 10 different monomers and at least one non-terminal thiol group, and at least one active substance capable of inhibiting enzymes.

13

55. A method of inhibiting zinc ion-dependent enzymes in an individual, said method comprising administering to said individual an effective amount of a pharmaceutical composition which comprises a mucoadhesive polymer having not more than 10 different monomers and at least one non-terminal thiol group, and at least one active substance capable of inhibiting zinc ion-dependent enzymes.

56. A method of preparing a mucoadhesive polymer, said method comprising

providing base polymers assembled of not more than 10 different monomers, wherein at least one of the non-terminal monomers includes a terminal, functional group I, said functional group I being free within said polymer,

providing thiol-containing compounds, said thiol-containing compounds including at least one further functional group II, wherein said functional groups I and II are together capable of forming a covalent bond, and

reacting said base polymers with said thiol-containing groups, said functional group I thereby forming a covalent bond with said functional group II.

57. A method as set forth in claim 56, further comprising adding coupling reagents when reacting said base polymers with said thiol-containing compounds.

58. A method as set forth in claim 57, wherein said functional group I is a carboxyl group and said functional group II is an amino group.

59. A method as set forth in claim 58, wherein said amino group is a primary amino group.

60. A method as set forth in claim 57, wherein said coupling reagents are carbodiimides, and amide bonds are formed.

61. A method as set forth in claim 56, wherein said thiol-containing compound is a mercapto-compound comprising a primary amino group.

62. A method as set forth in claim 61, wherein said thiol-containing compound is selected from the group consisting of cysteine and a cysteine derivative.

63. A method as set forth in claim 56, wherein said reacting of said base polymers with said thiol-containing groups is performed at a pH of between 4 and 8.

64. A method as set forth in claim 56, wherein said reacting of said base polymers with said thiol-containing groups is performed at a pH of between 5.5 and 6.5.

65. A method as set forth in claim 56, further comprising adjusting said prepared polymer to a pH of between 5 and 9.

66. A method as set forth in claim 56, further comprising adjusting said prepared polymer to a pH of between 6.5 and 8.5.

67. A method of preparing a pharmaceutical composition comprising a mucoadhesive polymer having not more than 10 different monomers and at least one non-terminal thiol group, said method comprising combining a mucoadhesive polymer having not more than 10 different monomers and at least one non-terminal thiol group with at least one active substance capable of being taken up via mucosae.

68. A method as set forth in claim 67, wherein said polymer is not covalently bound during said combining of said mucoadhesive polymer with said active substance.

69. A method as set forth in claim 67, wherein said mucoadhesive polymer and said active substance are combined by co-lyophilizing said polymer and said active substance.

70. A method of improving mucoadhesion of a polymer, said method comprising

introducing laterally arranged thiol groups into a polymer, and

applying said polymer with said thiol groups introduced thereinto to a mucus layer so as to form disulfide bonds between said polymer and said mucus layer.

71. A method as set forth in claim 53, wherein said drug further comprises at least one active substance to be taken up via said mucosa.

72. A polymer as set form in claim 30, wherein said derivatives are selected from the group consisting of derivatives obtained by auto-cross-linking, introduction of functional groups, attachment of complexing agents and coupling of enzyme inhibitors.

73. A polymer as set forth in claim 72, wherein said complexing agent is selected from the group consisting of EDTA.

74. A mucoadhesive polymer comprising not more than 10 different monomers and at least one non-terminal thiol group, wherein said polymer is selected from the group consisting of a thiolated copolymer of acrylic acid and divinyl glycol, thiolated chitosan,

thiolated sodium carboxymethylcellulose, thiolated sodium alginate, thiolated sodium hydroxypropylcellulose, thiolated hyaluronic acid, thiolated pectin and derivatives of said thiolated polymers.

75. A polymer as set form in claim 74, wherein said derivatives are selected from the group consisting of derivatives obtained by auto-cross-linking, introduction of functional groups, attachment of complexing agents and coupling of enzyme inhibitors.

76. A polymer as set forth in claim 75, wherein said complexing agent is selected from the group consisting of EDTA.

77. A polymer as set forth in claim 74, wherein said thiol groups are cysteine groups.

78. A polymer as set forth in claim 77, wherein said cysteine groups are bound to said polymer via an amide bond.

79. A polymer as set forth in claim 74, wherein said polymer includes at least one monomer having free thiol groups within said polymer.

80. A polymer as set forth in claim 74, said polymer exhibiting a total work of adhesion (TWA) increased by at least 50% relative to a mucoadhesive polymer not

containing at least one non-terminal thiol group, measured at a pH optimum of the total work of adhesion (TWA) of the thiolated polymer.

81. A polymer as set forth in claim 74, said polymer comprising at least 0.1 μmol of covalently bound thiol.

A3

82. A pharmaceutical composition comprising

a mucoadhesive polymer having not more than 10 different monomers and at least one non-terminal thiol group, wherein said polymer is selected from the group consisting of a thiolated copolymer of acrylic acid and divinyl glycol, thiolated chitosan, thiolated sodium carboxymethylcellulose, thiolated sodium alginate, thiolated sodium hydroxypropylcellulose, thiolated hyaluronic acid, thiolated pectin and derivatives of said thiolated polymers, and

at least one active substance capable of being taken up via mucosae.

83. A pharmaceutical composition as set forth in claim 82, wherein said active substance is non-covalently bound to said polymer.

84. A pharmaceutical composition as set forth in claim 82, wherein said active substance is a substance whose activity is enhanced by thiol groups.

85. A pharmaceutical composition as set forth in claim 84, wherein said active substance enhanced by thiol groups is a thiol-dependent enzyme.

86. A pharmaceutical composition as set forth in claim 85, wherein said thiol-dependent enzyme is selected from the group consisting of papain and subtilisin.

87. A method of enhancing permeation of active substances through mucosa in an individual, said method comprising administering to said individual an effective amount of a pharmaceutical composition according to claim 82.

88. A method as set forth in claim 87, wherein said pharmaceutical composition comprises an active (poly)peptide substance.

89. A method of treating an individual in need of a treatment which will adhere to a mucosa layer, said method comprising administering to said individual an effective amount of a pharmaceutical composition according to claim 82, wherein said pharmaceutical composition adheres to a mucosa layer selected from the group consisting of intradermal, intraocular and intraarticular mucosa.

90. A method of inhibiting enzymes in an individual, said method comprising administering to said individual an effective amount of a pharmaceutical composition according to claim 82, wherein said active substance is capable of inhibiting enzymes.

91. A method of inhibiting zinc ion-dependent enzymes in an individual, said method comprising administering to said individual an effective amount of a pharmaceutical composition according to claim 82, wherein said active substance is capable of inhibiting zinc ion-dependent enzymes.

92. A method of preparing a mucoadhesive polymer, said method comprising

providing base polymers assembled of not more than 10 different monomers, wherein at least one of the non-terminal monomers includes a terminal, functional group I, said functional group I being free within said polymer and wherein said functional group I is a carboxyl group,

providing thiol-containing compounds, said thiol-containing compounds including at least one further functional group II, wherein said functional group II is an amino group,

reacting said base polymers with said thiol-containing groups, said functional groups I thereby forming a covalent bond with said functional groups II,

and obtaining a mucoadhesive polymer.

93. A method as set forth in claim 92, further comprising adding at least one coupling reagent when reacting said base polymers with said thiol-containing compounds.

94. A method as set forth in claim 92, wherein said amino group is a primary amino group.

95. A method as set forth in claim 93, wherein said coupling reagents are carbodiimides, and amide bonds are formed.

96. A method as set forth in claim 92, wherein said thiol-containing compound is selected from the group consisting of cysteine and a cysteine derivative.

97. A method as set forth in claim 92, wherein said base polymers are reacted with said thiol-containing groups at a pH of between 5.5 and 6.5.

98. A method of improving mucoadhesion of polymers, said method comprising

introducing laterally arranged thiol groups into a polymer having no more than 10 different monomers, and

applying said polymers with said thiol groups introduced thereinto to a mucus layer so as to form disulfide bonds between said polymer and said mucus layer.

99. A method as set forth in claim 98, wherein said thiolated polymer is selected from the group consisting of a thiolated copolymer of acrylic acid and divinyl glycol, thiolated chitosan, thiolated sodium carboxymethylcellulose, thiolated sodium alginate, thiolated sodium hydroxypropylcellulose, thiolated hyaluronic acid, thiolated pectin and derivatives of said thiolated polymers.--